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The mental image which we may form of the monkish artist, with his rhyming motto, his logograph of 1681, his erroneous design of the star groups made indoors while the constellations were shining outside, may serve to recall to us something of the spirit of a time only two centuries ago. It must be remembered, too, that it was for this very comet of 1680 that Sir ISAAC NEWTON computed an orbit by his new methods, which showed that it revolved about the sun in a conic section, peacefully obedient to the law of gravitation. This medal, then, seems to mark a distinct division between two epochs in the history of astronomy (and in the history of human belief), and, therefore, to have a value quite apart from and above its numismatic rarity.

E. S. H.

AWARD TO THE LICK OBSERVATORY AT THE PARIS EXPOSITION.

The Lick Observatory exhibited at the Paris Exposition a frame of photographic views of Mount Hamilton and some photographs of the moon taken with the great telescope. The negatives were made by Messrs. BURNHAM and BARNARD, and the smaller prints were also by them. The enlargements from these negatives were made by Mr. TABER of San Francisco. A gold medal was awarded to the Observatory for the whole exhibit.

E. S. H.

"WEIGHING A DOUBLE STAR."

"In Professor E. C. PICKERING's third Annual Report of the DRAPER Memorial work, a very interesting fact is noted in connection with the spectrum of ζ *Ursæ Majoris*, of which more than seventy photographs have been taken. It has been found that the *K* line appears doubled at intervals of fifty-two days, beginning from March 27, 1887, and that for several days before and after the dates on which it appears doubled the line presents a hazy appearance. The other lines in the spectrum are much fainter, and, although well-shown when the *K* line is clearly defined, are seen with difficulty when it is hazy. Several of them are certainly double when the *K* line is double. * * * * *

As Professor PICKERING remarks, the only satisfactory explanation of this phenomenon is that the brighter component of this star must be a double star, having components nearly equal in brightness and too close to have been separated as yet visually, and that the time of revolution of the system is 104 days. When one component is approaching the earth, all the lines in its spectrum will be moved towards the blue, while all the lines in the spectrum of the other

component will be moved in the opposite direction. When the motion becomes perpendicular to the line of sight, the lines recover their true wave-length and become single.

"The relative velocity as derived from one set of measures comes out as ninety-four miles a second, and as one hundred and two miles per second from another set. If the orbit is circular, and its plane passes through the sun, the distance traveled by one component in fifty-two days, regarding the other as fixed, would be about nine hundred million miles; and the distance apart of the two components would be one hundred and forty-three million miles, or about equal to that of *Mars* from the sun. The combined mass of the two must be about forty times that of the sun, to give the required period; and if the orbit is inclined to the line of sight, the dimensions of the orbit and the corresponding masses must be greater.

"In a later postscript, written on January 11th, Professor PICKERING says that the period of ζ *Ursæ Majoris* appears to be fifty-two days, instead of one hundred and four, and that its orbit is noticeably elliptical.

"A similar phenomenon has also been observed with regard to the spectrum of β *Aurigæ*. The velocity of its components seems to be one hundred and fifty miles per second, and their period four days; their orbit nearly circular. If its plane passes through the sun, it must have a radius of eight million miles, and their joint masses must be about one-fifth of the mass of the sun."—*From Knowledge for March, 1890.*

COMET OBSERVATIONS AT MOUNT HAMILTON.

From a summary of the comet observations made all over the world, during part of 1888 and all of 1889, which is given in the *Vierteljahrsschrift der Astronomische Gesellschaft* (1890, page 70), the following is condensed:

Comet 1887 V = OLBERS' comet was observed at Mt. Hamilton by Mr. BARNARD until July 5, 1888. His last observations were three months later than those at any other Observatory.

Comet 1888 IV = FAYE's comet was observed at the Lick Observatory four days after the last European observation (Vienna).

Comet 1888 V: The last observation was made at the Lick Observatory.

Comet 1889 I was discovered at the Lick Observatory by Mr. BARNARD, on September 2, 1888. This comet is remarkable for